

# ***Headquarters U.S. Air Force***

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## **Former Williams AFB Restoration Advisory Board (RAB)**



**August 24, 2010**

**Highland High School  
4301 E. Guadalupe Rd.  
Gilbert, AZ**

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## **Welcome & Introductions**

Presented by: Ms. Michelle Lewis  
& Mr. Len Fuchs,  
RAB Community Co-Chairs



## ***Welcome & Introductions***

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- **Mr. Len Fuchs, RAB Community Co-Chair**
- **Ms. Michelle Lewis, Air Force Center for Engineering & the Environment, PM/BEC and RAB Co-Chair**
- **Ms. Carolyn d'Almeida, Project Manager, U.S. Environmental Protection Agency, Region IX**
- **Mr. Andre Chiaradia, Project Manager, Arizona Department of Environmental Quality**



# Agenda

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<u>Time</u>	<u>Topic</u>	<u>Presenter</u>
7:00 p.m.	<b>RAB meeting convenes</b> <ul style="list-style-type: none"><li>• Welcome and introductions</li><li>• Community Co-chair remarks</li><li>• Review May 2010 meeting minutes</li></ul>	<b>Ms. Michelle Lewis</b> <b>Mr. Len Fuchs</b>
7:15 p.m.	<b>Program Updates</b> <ul style="list-style-type: none"><li>• Environmental Updates</li><li>• Contracting Updates</li><li>• Property Transfer Update</li></ul>	<b>Ms. Michelle Lewis</b> <b>Mr. Jay Harbin</b> <b>Mr. Jeff Schone</b>
8:30 p.m.	<b>Meeting wrap-up</b> <ul style="list-style-type: none"><li>• Community Involvement and Review action items for next meeting</li><li>• Call for agenda items for next meeting</li><li>• Propose next RAB meeting date: Nov 16, 2010</li></ul>	<b>Ms. Michelle Lewis</b> <b>Mr. Len Fuchs</b> <b>Ms. Amber Cargile</b>
9:00 p.m.	<b>Adjourn</b>	<b>Ms. Michelle Lewis</b> <b>Mr. Len Fuchs</b>

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## ***Minutes and Action Items***

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- Review May 2010 RAB meeting minutes
- Action Items from May 2010 RAB meeting

Presented by:  
Ms. Michelle Lewis, AFCEE and  
Ms. Amber Cargile, Cargile Communications

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## **Program Updates:**



**ST012, ST035, LF004 and  
Parcel N Debris Area (PNDA)**

Presented by:

Ms. Michelle Lewis, AFCEE  
Mr. Jay B. Harbin, URS Corp  
Mr. Jeff Schone, BEM Sys

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## **ST012 Thermal Enhanced Extraction Evaluation Report Summary**





# Former Williams Air Force Base

## *Site ST012 Location*



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## ***Site ST012 Update Thermal Enhanced Extraction (TEE) Pilot***

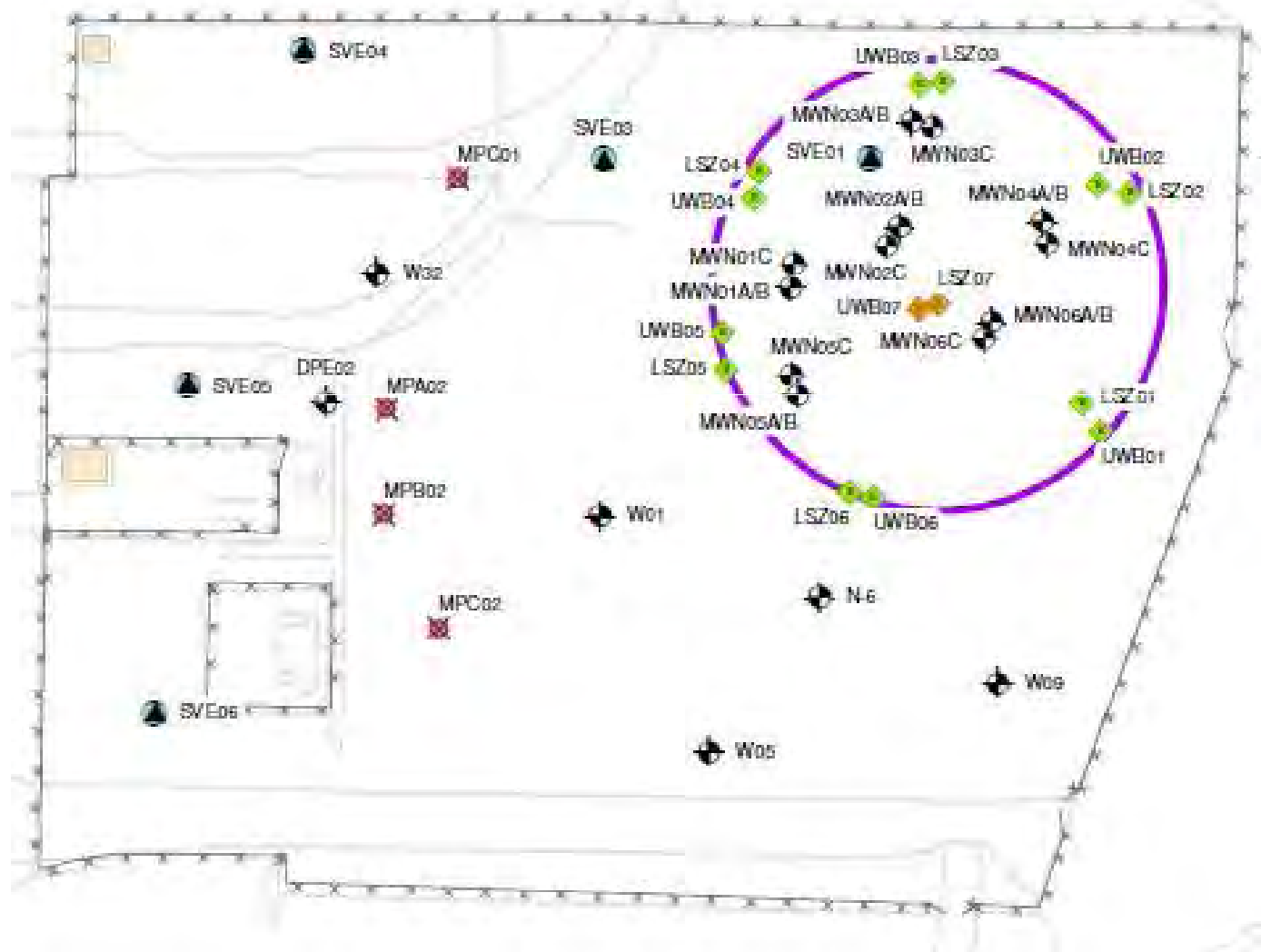
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<b>Event</b>	<b>Date</b>
System Startup	Oct 2008
System Shut-down	Dec 2009
Draft TEE Report to ADEQ and EPA	Jul 2010
Final TEE Report	Nov 2010



# ST012 Pilot Test Area

-  TEE Pilot Test Cell
-  Monitoring Well Location
-  Soil Vapor Extraction Well
-  Phase 1 TEE Pilot Test Injection Well
-  Phase 1 TEE Pilot Test Extraction Well
-  Fence



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## ***Revised NAPL Volume Estimates***

Zone	Estimate	NAPL volume (gal)
UWBZ (A-Zone)	1999 - Minimum	500,000
	1999 - Maximum	1,290,000
	2010	264,000
LSZ (B & C Zones)	1999 - Minimum	418,000
	1999 - Maximum	2,110,000
	2010	783,000



# ***TEE Pilot Test Results Evaluation Criteria***

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- Hydraulic Containment Assessment
- Steam Zone Growth and Soil Heating and Cooling (Energy Balance)
- Mass Removal Assessment



## ***TEE Pilot Test Results***

### ***Hydraulic Containment Assessment***

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- NAPL mobilized by steam injection was captured and no significant impacts migrated to the outside of the TEE cell
- Hydraulic containment was maintained in the UWBZ and LSZ



## ***TEE Pilot Test Results – Steam Zone Growth and Soil Heating and Cooling (Energy Balance)***

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- Demonstrated that energy did not escape the TEE Cell laterally in both the LSZ and UWBZ
- Heating of the vadose zone
  - Via conductive heat losses from the Pilot Test
  - Enhanced recovery of volatile petroleum hydrocarbons via soil vapor extraction



## ***TEE Pilot Test Results – Mass Removal: Assessment of Thermal Enhancement***

	Gallons Removed	LSZ % Mass Removed	UWBZ % Mass Removed
PHCs	18,000	12-20%	15-19%
Benzene	540	89%	72%

- Soil and groundwater fuel compound concentrations decreased
- Generally met test objectives of the TEE Pilot Test Work Plan
- Fuel sources were not mobilized outside the test cell



# ***TEE Pilot Test Results Mass Reduction Assessment***

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- Source Mass Estimates
  - Multiple Lines of Evidence
  - Five Approaches Considered
    - Evaluation based on Approach #3



# ***TEE Pilot Test Results***

## ***Estimate of ST012 Source Term***

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### ■ Objective (Approach #3):

- Literature NAPL Saturation Values:
- Initial PHC mass was calculated by multiplying recent typical NAPL saturations for various soil types
- Evaluate benefits of applying TEE across the source zones
- Required defining Source Term after application of TEE (Modeling)

### ■ Summary:

- More aggressive treatment or with a combination of technologies could yield a bulk NAPL removal as high as 50%



## ***TEE Pilot Test Results - Groundwater and Transport Modeling Results***

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### **Time to achieve 5 µg/L Benzene at the Reference Boundary**

NAPL Mass Estimate	Remedial Scenario	LSZ	UWBZ
1999	Pilot-Scale TEE plus MNA	>100 years	>100 years
	Full-Scale TEE plus MNA	80-90 years	>100 years
2010	Pilot-Scale TEE plus MNA	80-90 years	>100 years
	Full-Scale TEE plus MNA	20-30 years	>100 years

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## **ST012 Long Term Monitoring and SVE Update**



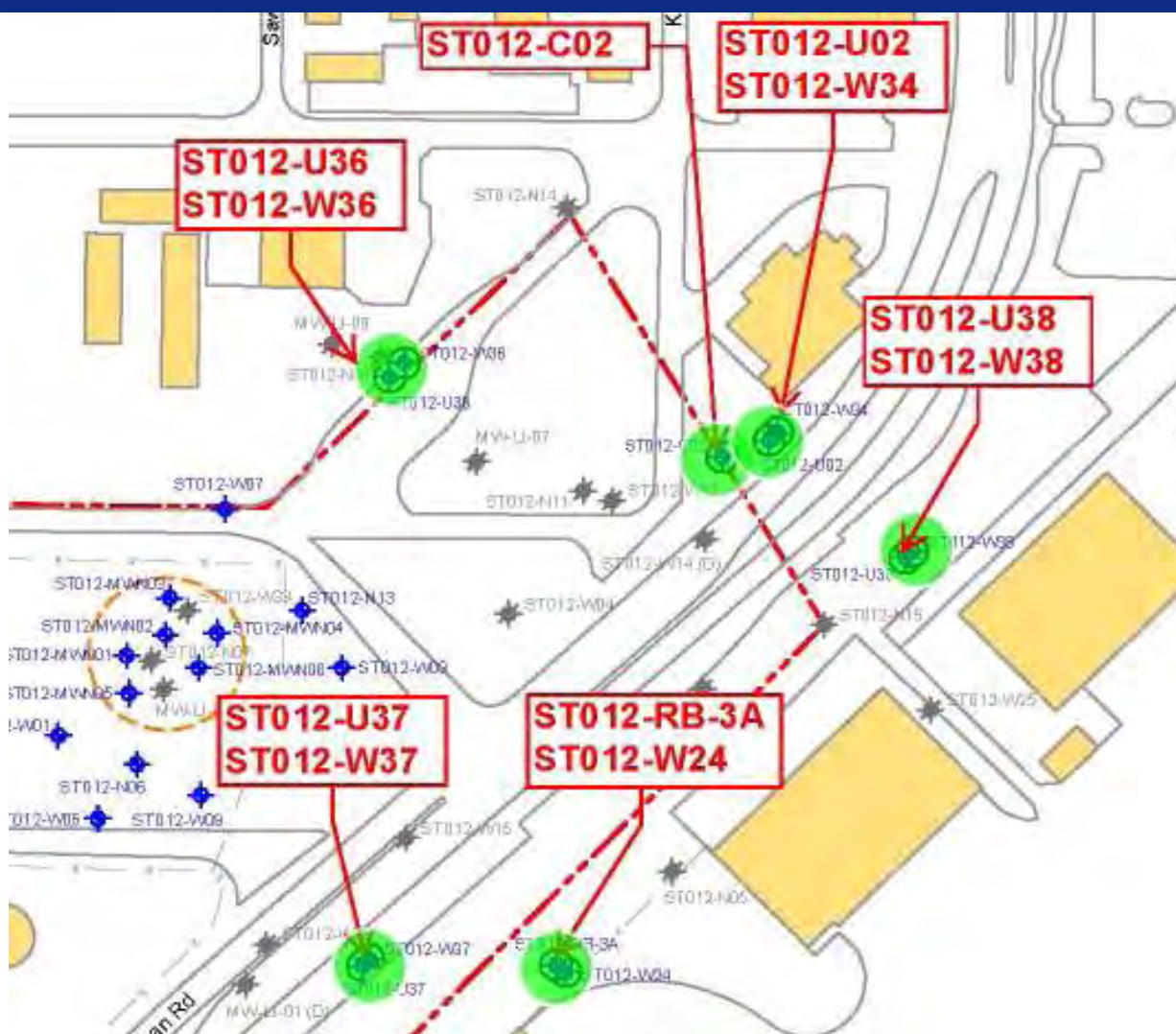
## ST012 LTM Sampling Update

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- 2010 Long Term Monitoring
  - Quarter 1 (PDBs in 11 wells) – Completed Mar 2010
  - Quarter 2 (PDBs in 11 wells) – Completed Jun 2010
  - Annual Event (Low-Flow in 28 wells) – Scheduled for November 2010



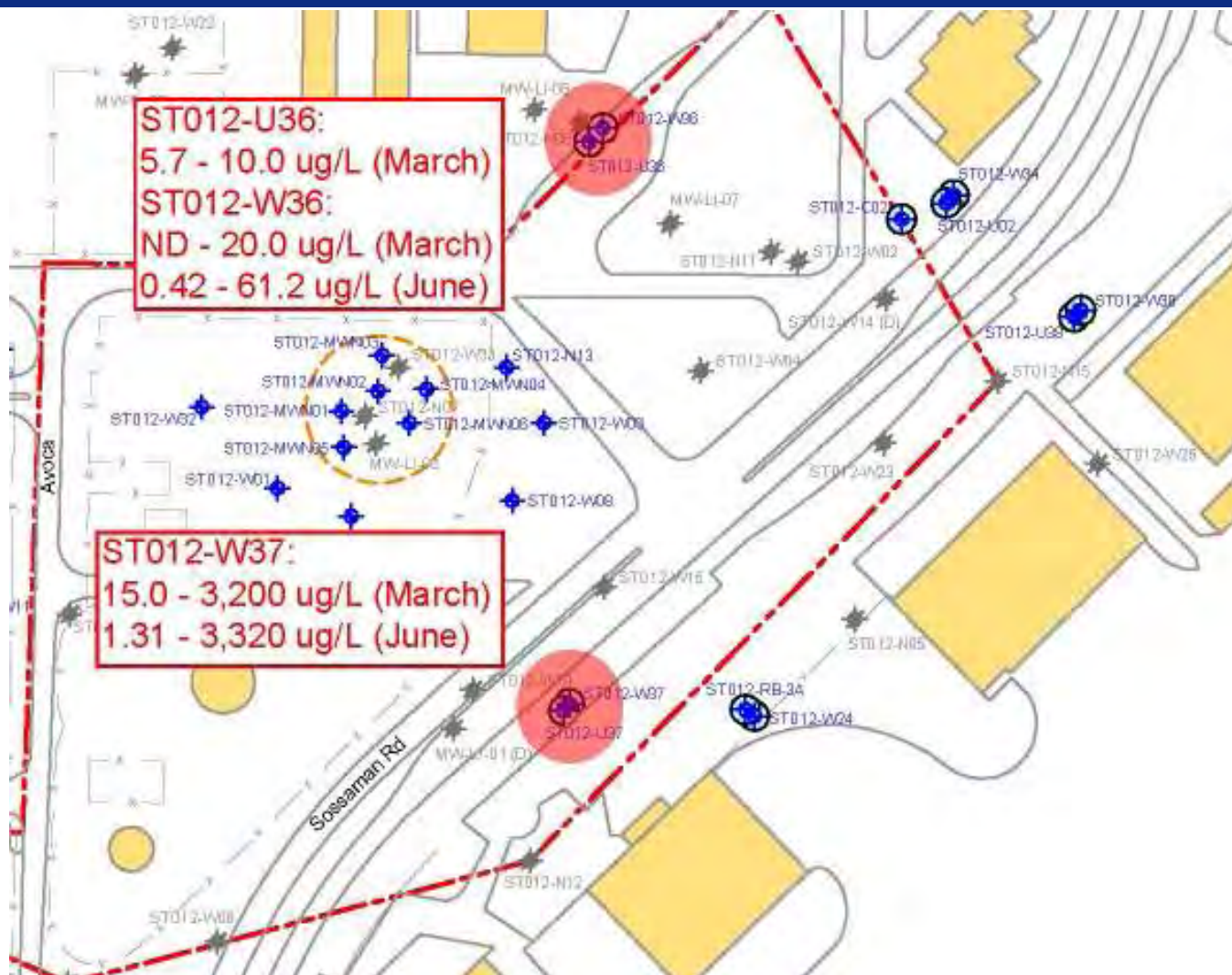
# ST012 LTM Sampling Update



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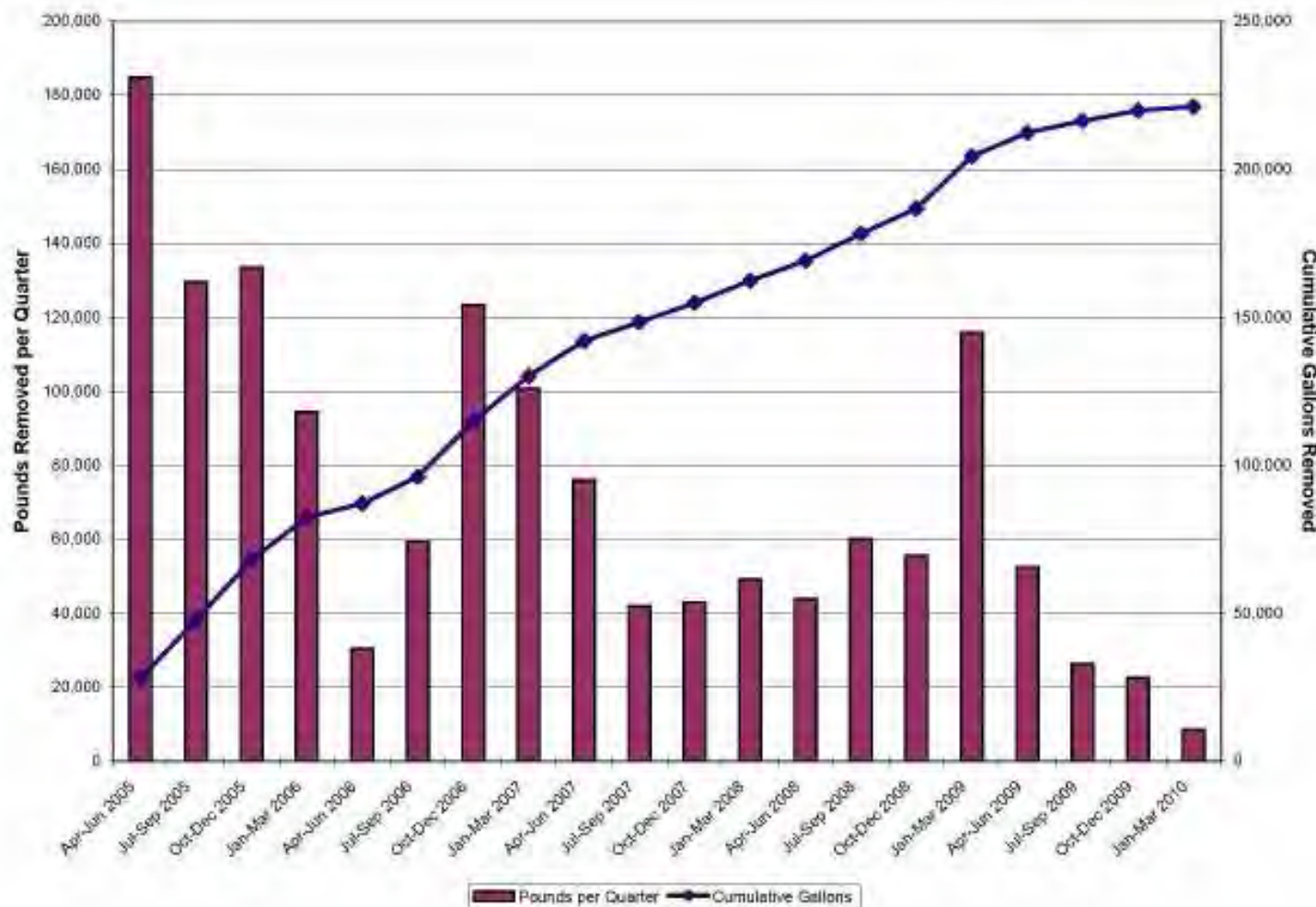
# ST012 LTM Sampling Update





# Site ST012 SVE System Update

## Mass Removed from 2005-2010



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## **Site ST035 Update**



## ST035 LTM Sampling Update

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- 2010 Long Term Monitoring
  - Quarter 1 (Sample 8 monitoring wells) – Completed Mar 2010
  - Quarter 2 (Sample 13 monitoring wells) – Completed Jun 2010
  - Quarter 3 (Sample 13 monitoring wells) – Sampling this week
  - Quarter 4 (Sample 13 monitoring wells) – Scheduled for Nov 2010



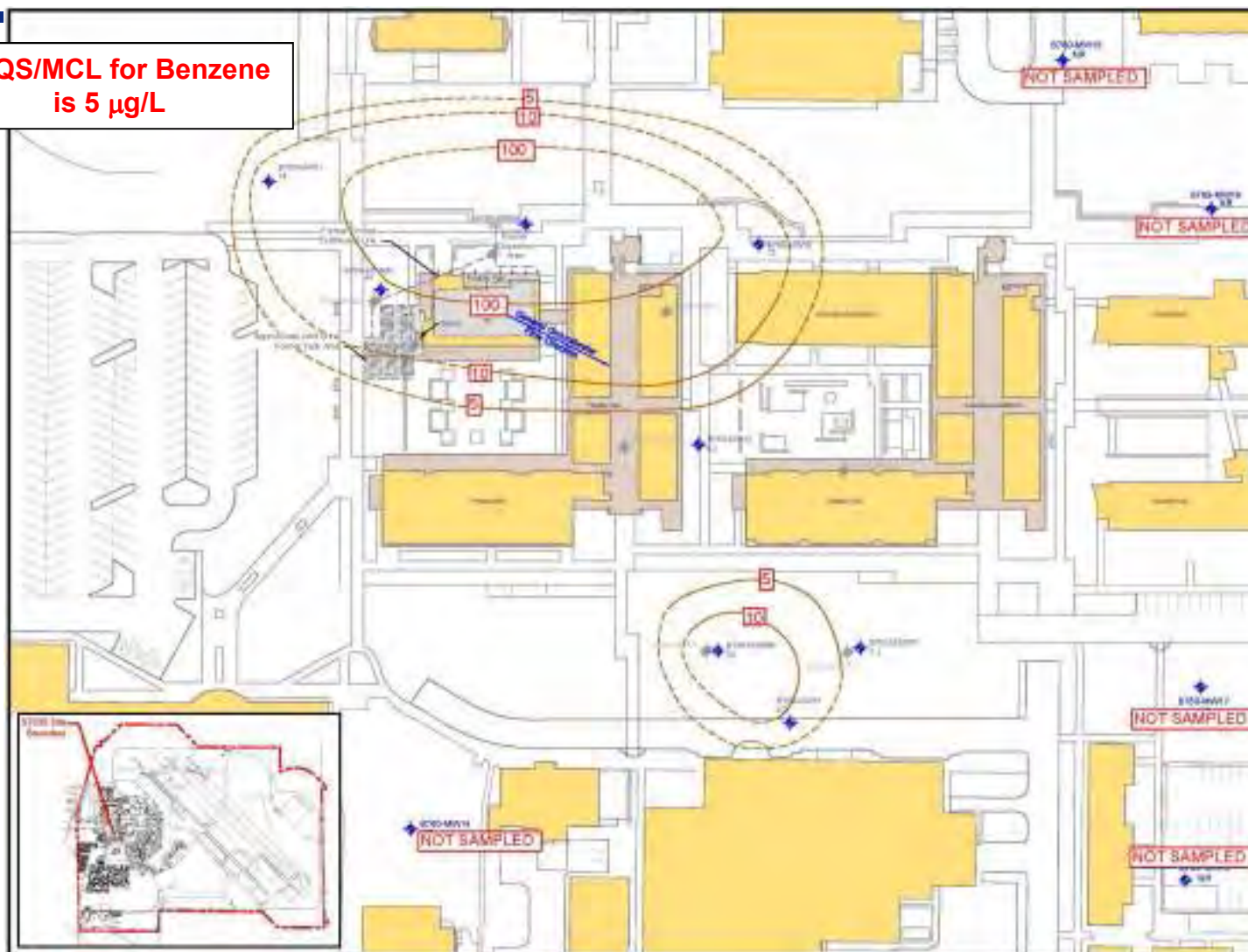
## ***ST035 (Former Building 760) Dec 2009 Groundwater Gradient***





## ST035 (Former Building 760) Mar 2010 Benzene Contours

AWQS/MCL for Benzene  
is 5 µg/L

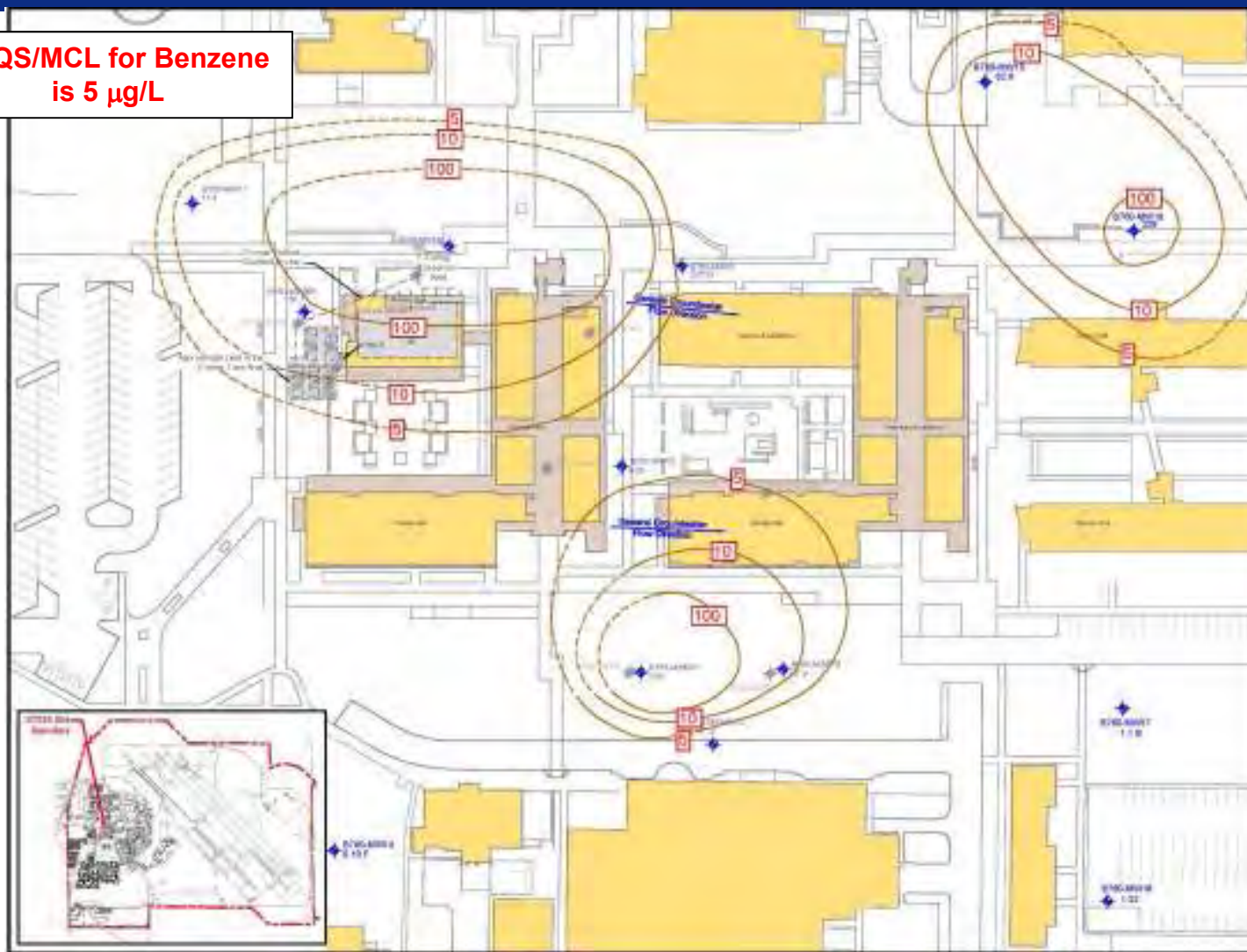


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## ST035 (Former Building 760) Jun 2010 Benzene Contours

AWQS/MCL for Benzene  
is 5 µg/L





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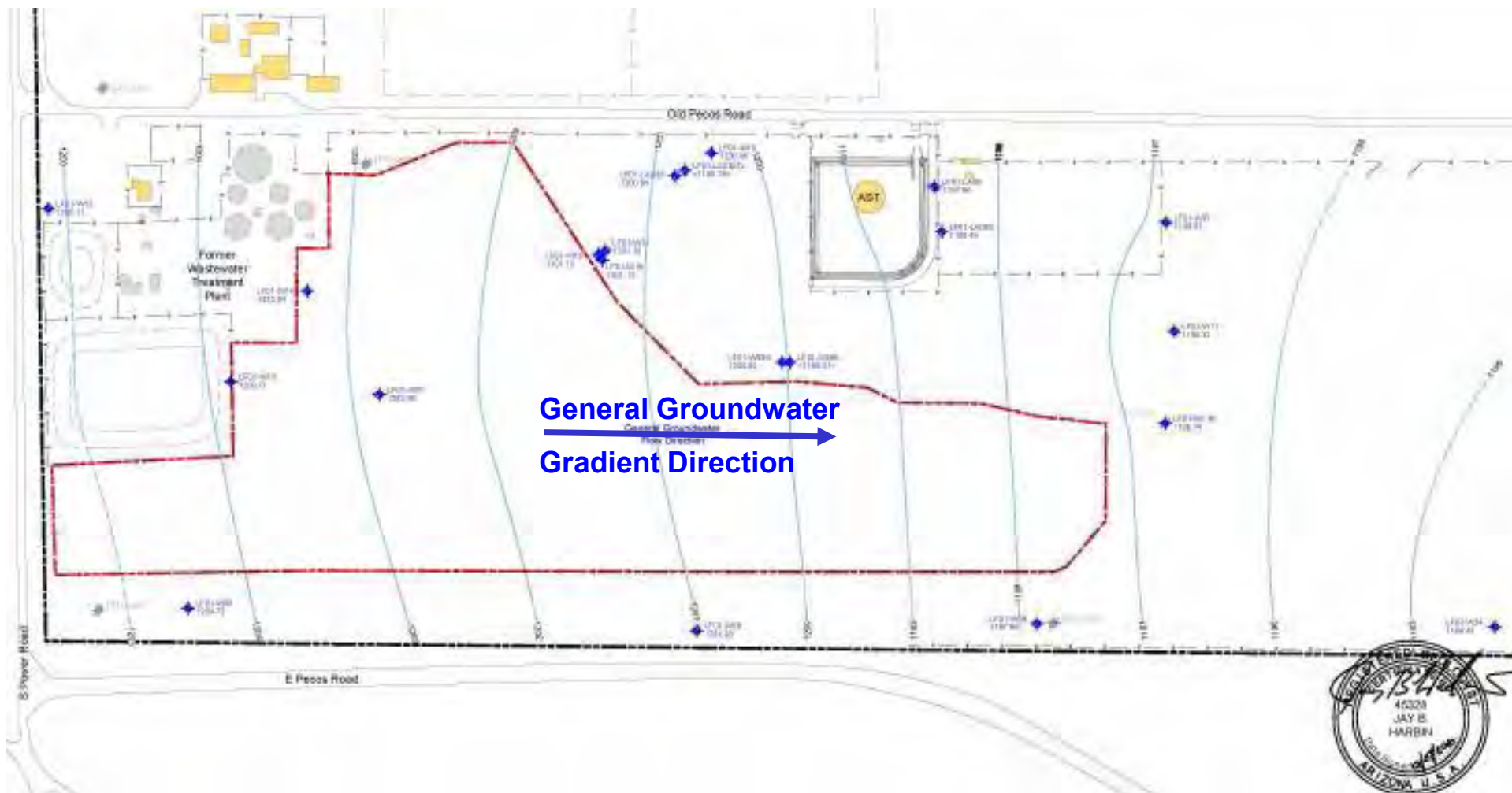


## **Site LF004 Update**



# LF004 Long Term Monitoring Update

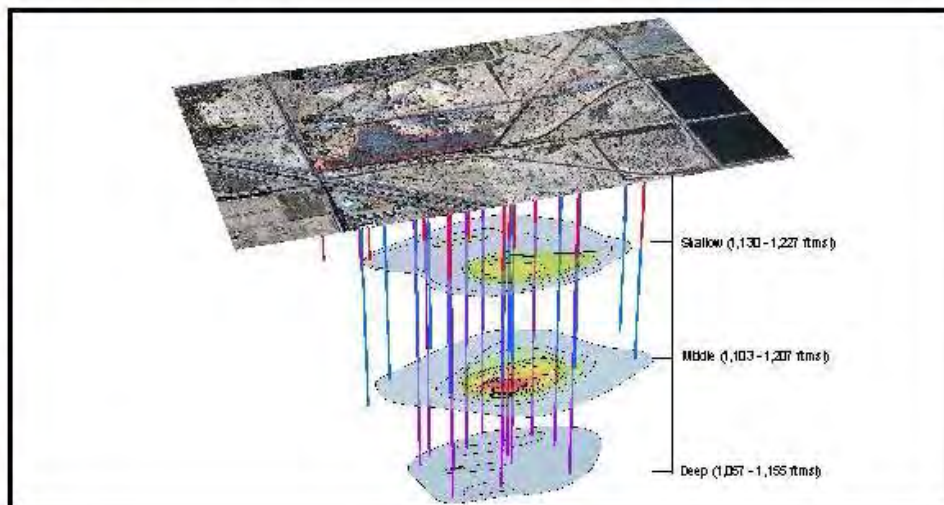
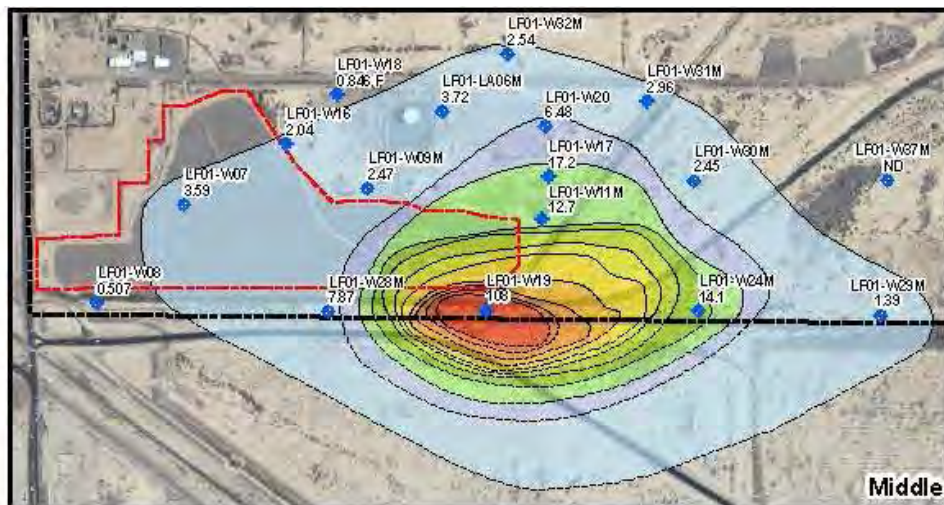
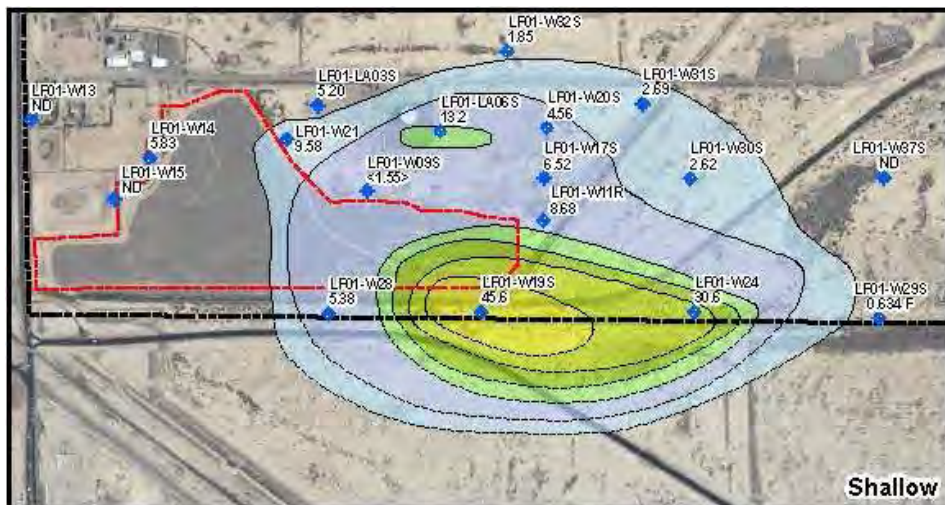
## Groundwater Gradient





# LF004 Long Term Monitoring Update

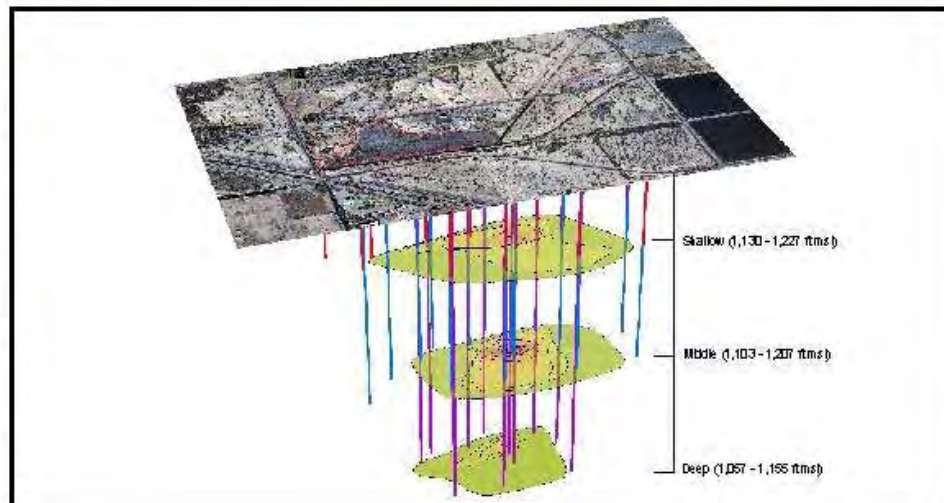
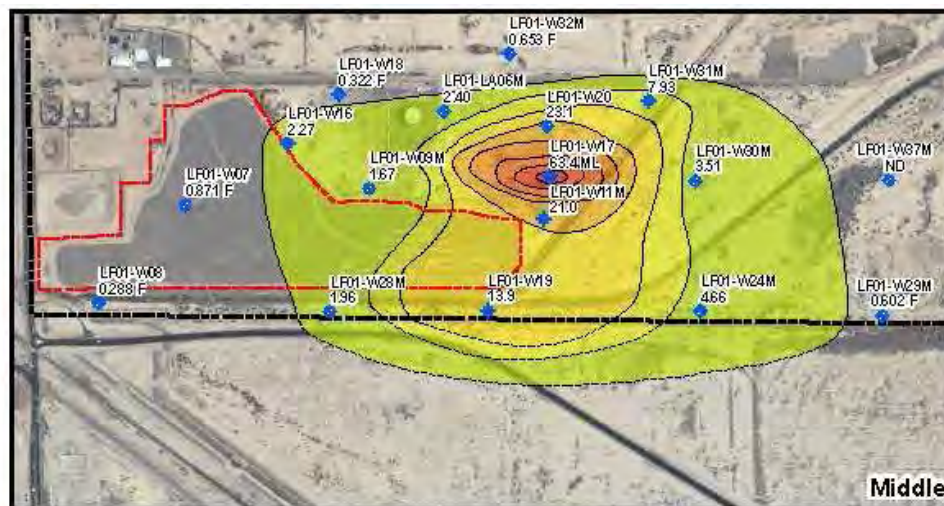
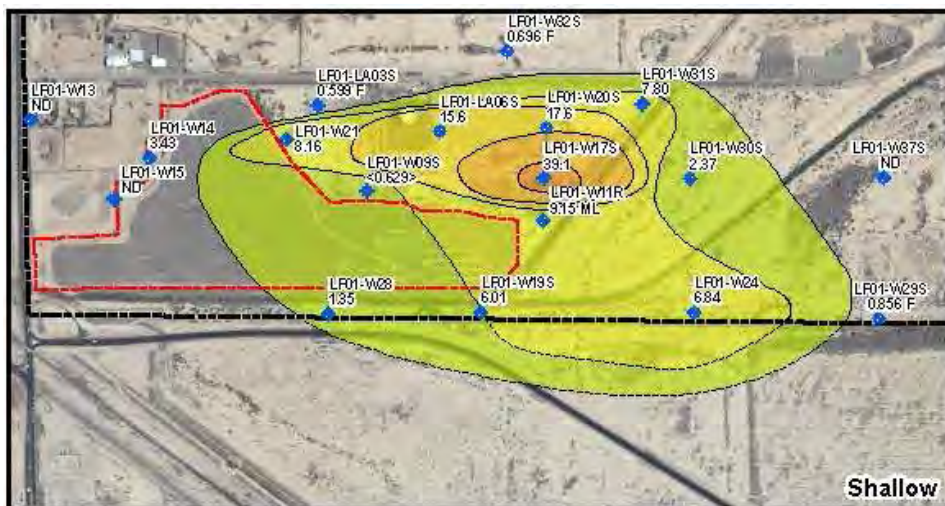
## PCE Distribution





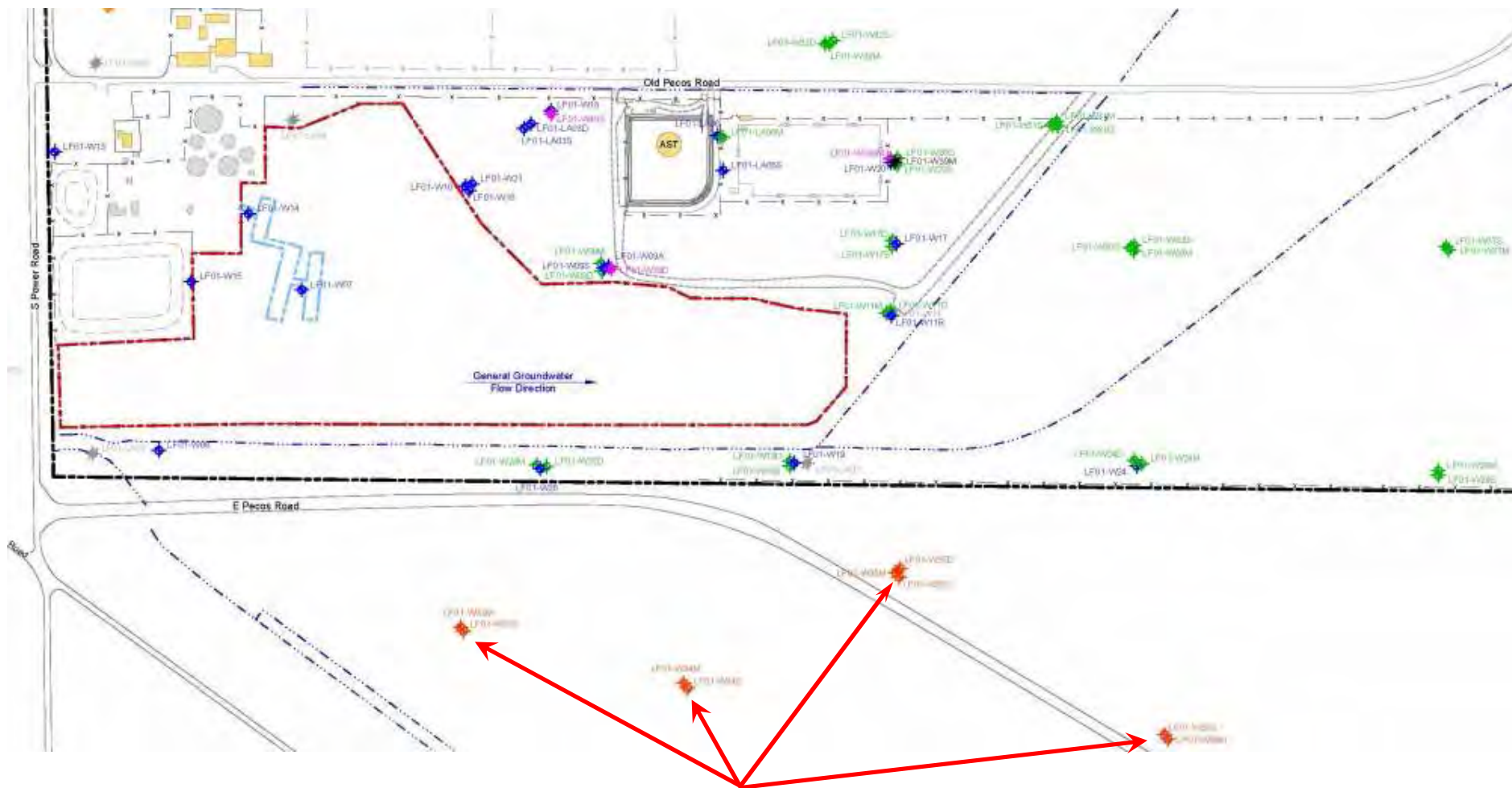
# LF004 Long Term Monitoring Update

## TCE Distribution





## LF004 Long Term Monitoring Update Off-Site Monitoring Wells



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## ***LF004 RI/FS Update***

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- AF has completed the Supplemental Remedial Investigation and Feasibility Study (RI/FS) – Draft Document was submitted to ADEQ/EPA in Apr 2010
- AF has received comments from the ADEQ and EPA and is working on responses now
- A Draft Final RI will be produced to address regulatory comments.
- The Draft Final FS will be delayed until the performance-based remediation contractor has an opportunity to respond to regulatory comments

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## **Parcel N Debris Area Site Inspection and Munitions and Explosive Concern (MEC) Investigation**



## ***PNDA – SI/MEC Investigation Site Map***



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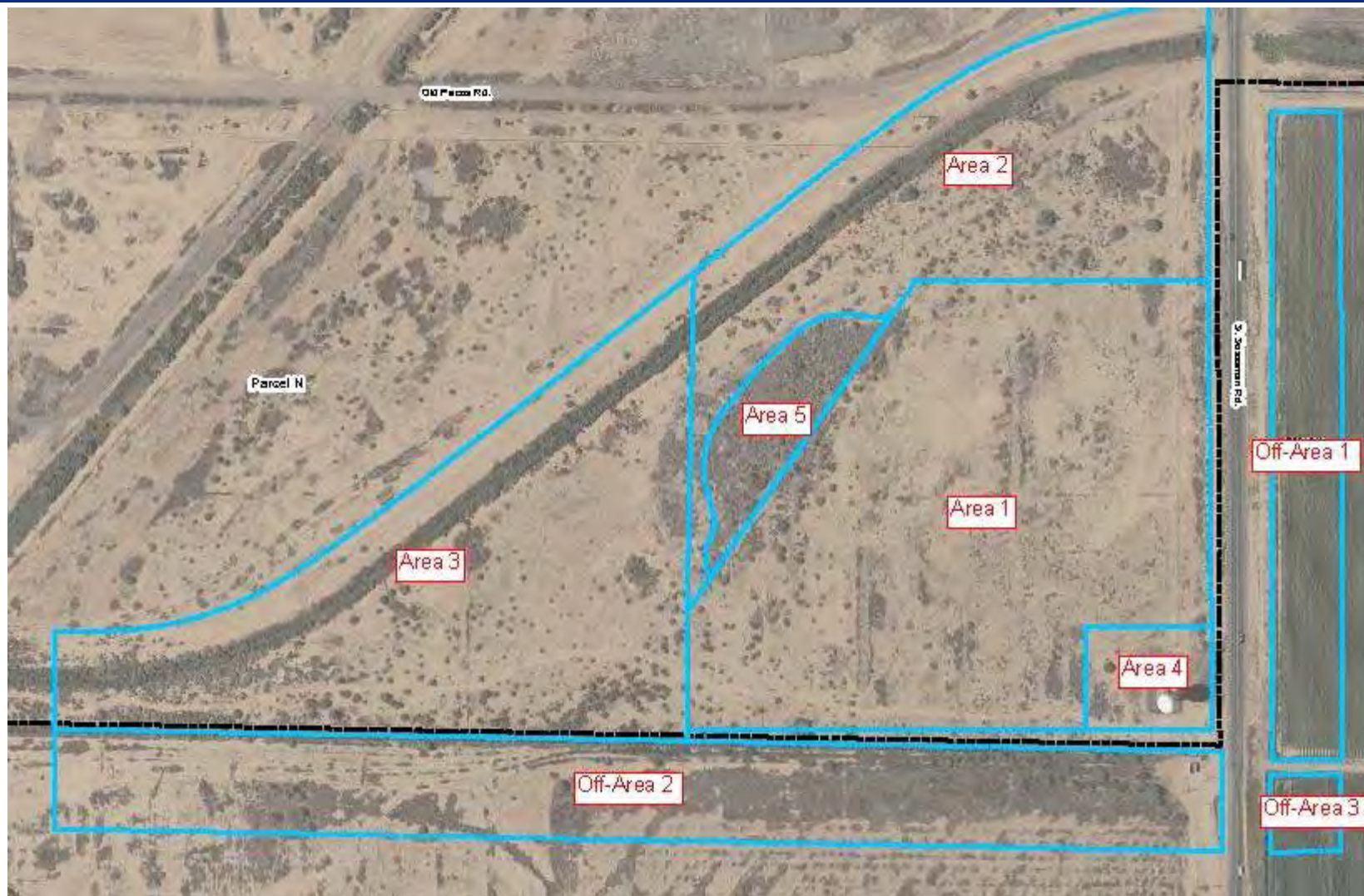
## ***PNDA – Timeline***

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- **Oct 2003** – Initial site discovery by Technical Working Group (ADEQ and AF). The TWG discovered ruptured .50 cal cartridges on the surface.
- **Dec 2005** – AFRPA performed a Remedial Process Optimization (RPO) review where this site was addressed.
- **Jan 2009** – The AF conducted a Preliminary Assessment and recommended additional follow-on activities.
- **Summer 2010** – The AF conducted a MEC Site Investigation.



## ***PNDA – SI/MEC Investigation Site Map***



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## ***PNDA – SI/MEC Investigation***

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### ■ **SI/MEC Investigation (Phase I)**

- Perform a detector-aided visual surface clearance over new areas (Areas 3 and 4 and Off Site Areas 1, 2, and 3) and beyond if needed to establish site boundary
- Inspect all material removed from the surface for munitions-related items
- Determine if site boundaries were adequate



## ***PNDA – SI/MEC Investigation***

### ***Detector-Aided Surface Clearance (All Findings To Date)***

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- Two types munitions and explosives of concern (MEC) items was discovered
  - One electric blasting cap
  - Twenty small pieces of explosive filler (weighing approximately 10 ounces total) that tested positive for TNT
  - MEC items were turned over to Mesa Police Dept Bomb Squad for disposal
- Munitions debris (containing no energetic material)
  - Ruptured .50 caliber cartridges
  - 5.56mm blank cartridges
  - Pieces of signal flares and other pyrotechnic devices
  - Thermite residue and firing wire
  - MD items were shipped to a specialized recycling facility that deals with munitions-related items
- Non-munitions related debris included
  - Empty 55 gallon drums
  - Debris pile (wood, aerosol cans, etc.)
  - Chemical Agent Identification Set (CAIS) bottles



## ***PNDA – SI/MEC Investigation***

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**MEC Item – Electric Blasting Cap**



**Munitions Debris (MD) – Small Arms Cartridges**



**Partial 55-gal Drum**



**55-gal Drum**



**Debris Pile: wood, oil can, aerosol can**

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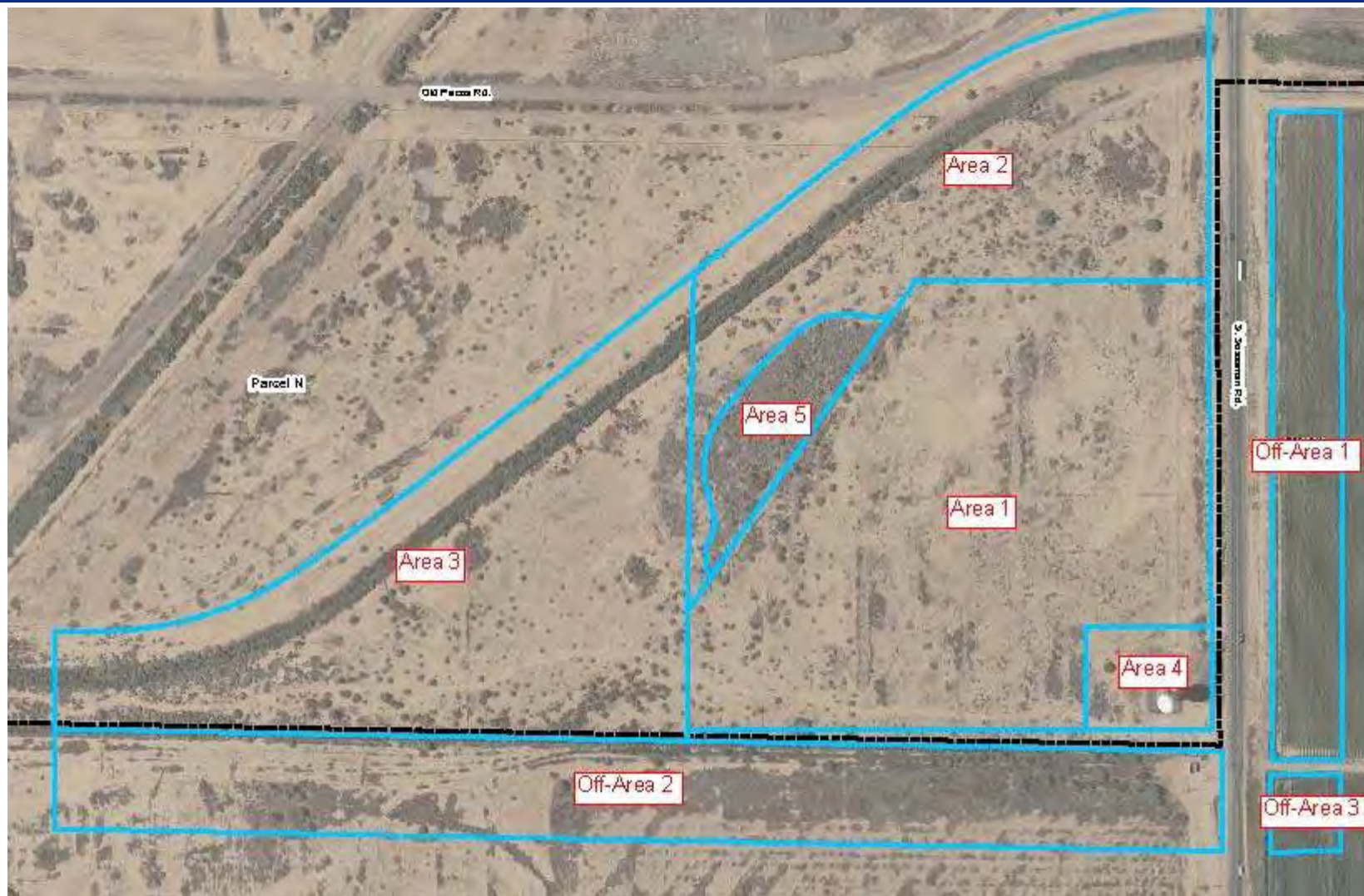
## ***PNDA – SI/MEC Investigation***

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- SI/MEC Investigation (Phase 2)
  - Digital Geophysical Mapping (DGM) data were collected over designated transects in Areas 2, 3, and 4 and Off-Site Areas 1, 2, and 3 [40.5 acres total]).
  - The investigation did not include 8.1 acres where rights-of-entry (ROE) from property owners were not obtained.
  - Based on DGM results, selected target anomalies were reacquired and excavated in Areas 1, 2, 3, and 4 to determine if target anomalies.
  - Recovered items were inspected for the presence of MEC or munitions-related activities.



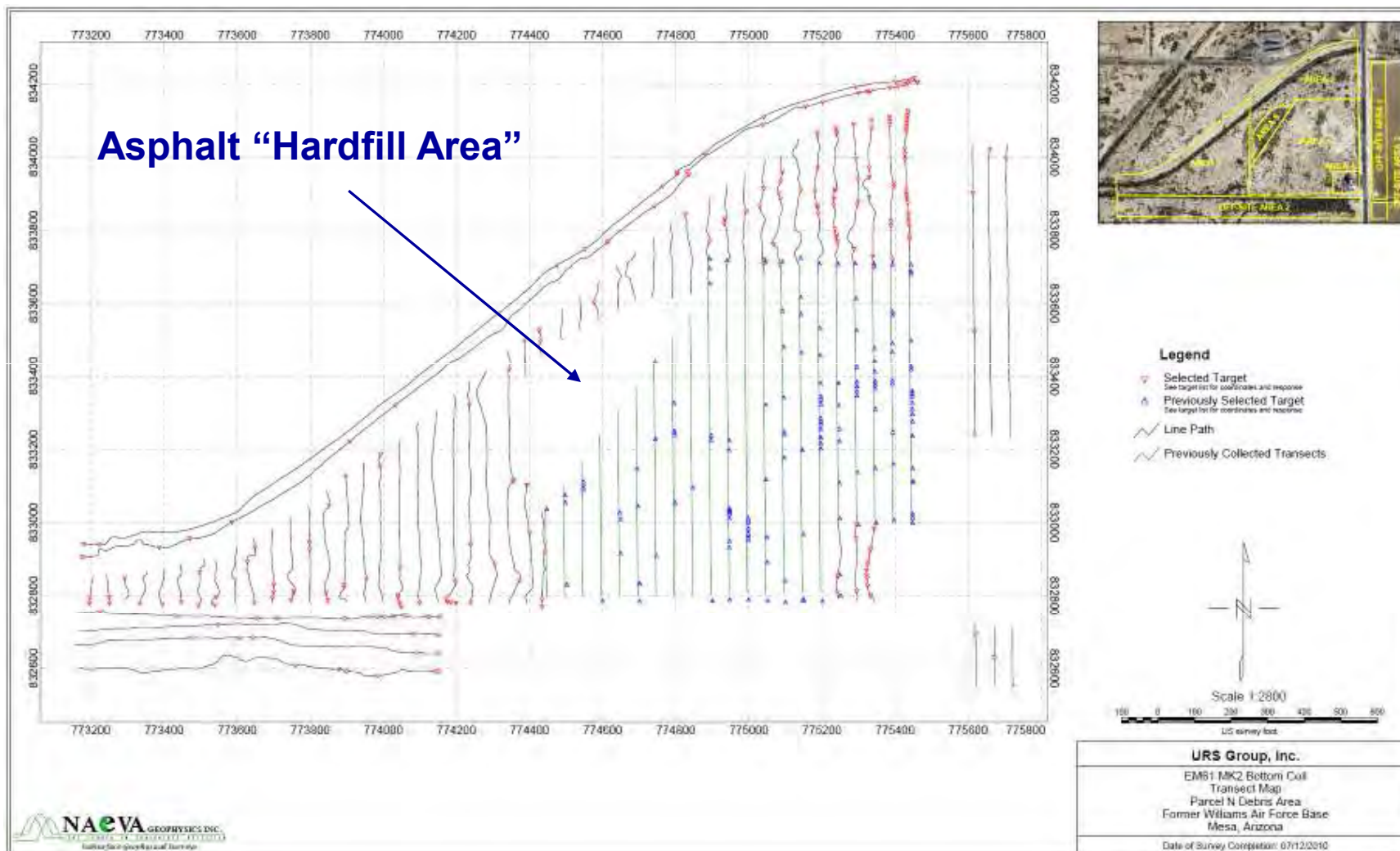
## ***PNDA – SI/MEC Investigation Site Map***



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# ***PNDA – SI/MEC Investigation Results for Geophysical Survey***



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## ***PNDA – SI/MEC Investigation***



**Melted aluminum from signal flare (MD)**



**QC blind seed item**



**Excavating a fence post**



**Burned .50 cal projectiles (MD)**

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## ***PNDA – SI/MEC Investigation Next Steps***

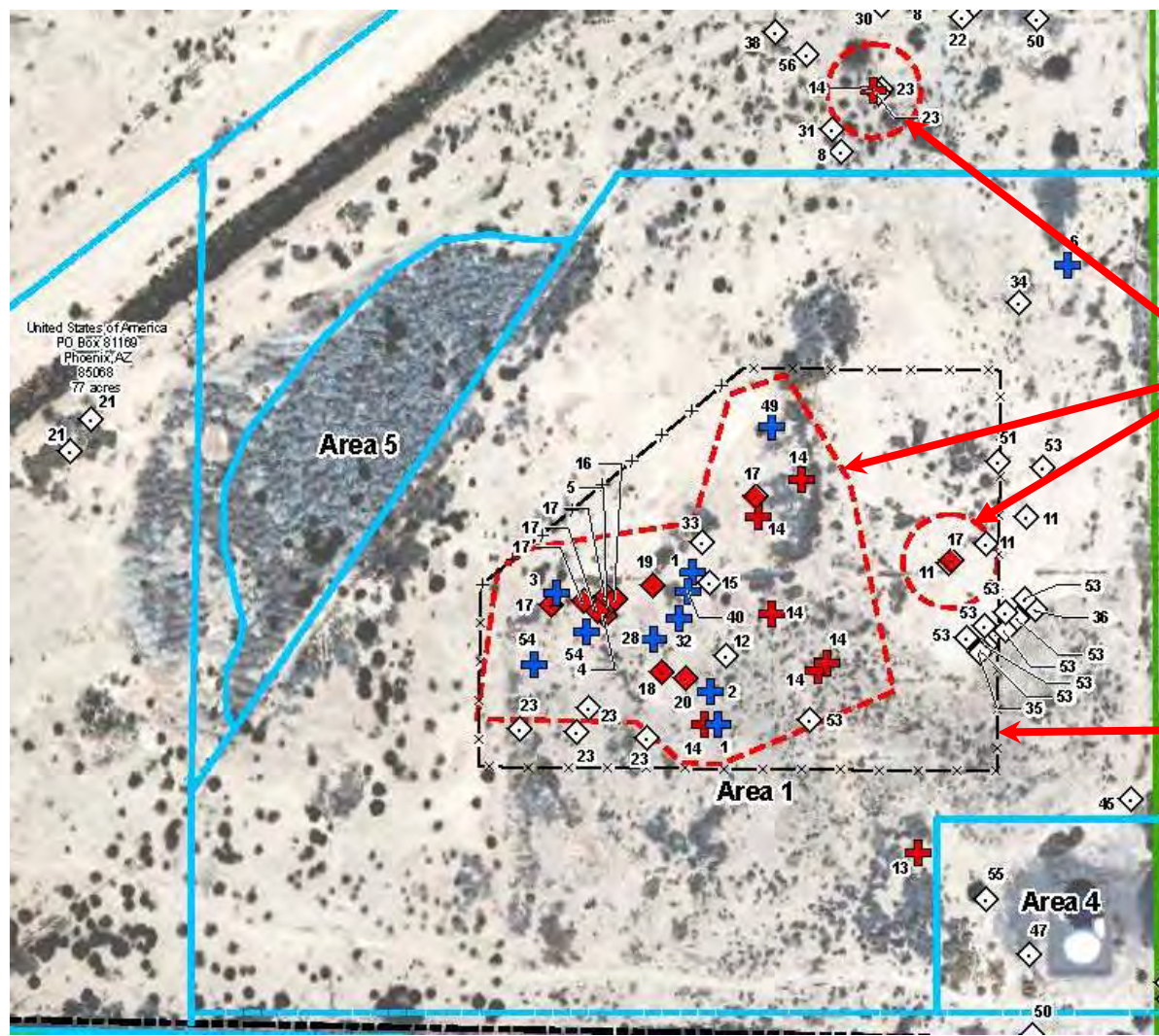
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### **■ *Next Steps....***

- Erect an additional temporary fence where MEC, Chem, and MD items were located
- Conduct follow-on soil sampling and test pit trenching outside of temporary fence for other environmental chemicals of concern
- Prepare a combined SI and MEC Investigation Report
- Conduct follow-on MEC investigation/removal inside temporary fenced area



# ***PNDA – SI/MEC Investigation Next Steps***



**Proposed area for  
Phase 3 MEC  
investigation and  
removal  
(approx 3 acres)**

**Future Inner Security  
Fence  
(approx 4.5 acres)**

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## **Contracting Update**

Presented by:  
Ms. Michelle Lewis, AFC EE



## ***Contracting Update***

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### ■ Upcoming Contracts:

- 5-year Review
- Storage and maintenance for ST012 TEE equipment
- Performance-Based Remediation Contract
  - LTM activities at all active sites
  - O&M activities at SVE sites (ST035 and ST012)
  - Amended Proposed Plan and ROD at OU-1 (LF004)
  - Design/Construct Remediation System at LF004
  - Design/Construct Remediation System at ST012
  - Design/Construct Groundwater Remediation System at ST035

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## **Property Transfer Update**



Presented by:  
Ms. Michelle Lewis, AFCEE



# Property Transfer Update



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## **Community Involvement Oct. 9, 2010**



Presented by:  
Ms. Amber Cargile, Cargile Communications

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## **Action Items**



Presented by:  
Ms. Amber Cargile, Cargile Communications

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## **Meeting Wrap-Up**



Presented by:  
Ms. Michelle Lewis and Mr. Len Fuchs,  
RAB Community Co-Chairmen



## ***Meeting Wrap-Up***

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- Propose agenda items for next RAB meeting
- Schedule next RAB meeting (Nov 16, 2010)
- Meeting adjourned